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U1702242 – Biological psychology case studies – PY4102

Clinical and Community Psychology II Mental Health (University of East London)

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Case study 1 – The steroids made me do it!

Dee is in her early forties and a few years ago became passionate about bodybuilding. She describes herself as having become 'addicted' to training and building muscle mass as fast as she could. To help her do this she has been using large doses of steroid hormones; mainly testosterone or testosterone-like substances. These has helped her to enter competitions (though she has yet to win) but she feels they have had some negative effects on her mood and ability to deal with stressful situations. Dee reports episodes of explosive temper, often in response to stressful situations, but feels generally quite irritable. She worries that this is evidence of a phenomenon she has read about online, which is called 'roid-rage'; she thinks the extra testosterone in her system is making her more aggressive. Things have come to a head recently, when a simple disagreement with a neighbour led her to damaging his front door, for which she received a police caution. Her neighbour however, and her partner feel she has always been a little short tempered. Dee wants to know if she should stop taking these hormone supplements and give up her dream of winning competitions.

Using the suggested references, your textbook(s), and online resources (i.e. other references you can find), address and discuss the following:

1. **What is the normal role of testosterone in humans?**

According to Martin, Carlson and Buskist (2004), Testosterone is present in both genders and fluctuates in accordance with age and life circumstances. The hormone is essential for sexual and reproductive development and has physical and psychological effects. Physically, testosterone is involved in sperm production, bone and muscle structure and hair growth, whilst psychologically it affects aggression, mood, libido, sexuality, and gender identity.

2. **What evidence is there that <u>on their own</u>, testosterone and similar steroid drugs could produce aggressive behaviour such as that Dee has/is exhibiting?**

Vast amounts of research point towards the idea that testosterone and similar steroid drugs produce aggressive behaviour. A group of behavioural neuroscientists led by Menno Kruk discovered a fast-positive feedback loop between a hormonal stress response and aggression systems within rat's brains. Given how similar our neurophysiology is to that of rats, the finding is key. If this same or similar mechanism is found in humans it could aid an explanation for why steroid users such as Dee have had aggressive outbursts due to small stressors, but moreover why aggressive behaviour triggers ongoing stress and her general feelings of irritability. Michael Potegal states that these results are consistent with and builds upon earlier research. His team found during their research that there was a rise in cortisol within saliva after tantrums in 3-year-old's, suggesting the aggressive behaviour of the tantrum triggers an ongoing stress response, evident from the cortisol levels.

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3. **What could be the significance of stress combined with testosterone in this case?**

Research has pointed towards the idea that cortisol and testosterone, which are both steroid hormones, jointly regulate aggression. When someone has an imbalance between cortisol and testosterone levels, it tends to predict aggressive behaviour (Montoya et al 2012). This suggests that, if either hormones level differs to the standard, there is likely to be implications on aggression. This is seen from the fact that since Dee has started taking steroids she has been unable to regulate her aggression, having had episodes of explosive temper and becoming more aggressive. As well as this, her cortisol levels will be high too, since she has always been a little short tempered and described her anger being in response to stressful situations.

4. **Are there other factors to consider or measure when assessing Dee's behaviour? Is it all about the testosterone?**

Aggression is triggered by threats and challenges to status and resources (McAndrew, 2009). Other than testosterone there are other factors which promote aggression. Electrical stimulation of brain regions can trigger aggression, as can low levels of serotonin. Additionally, genetic differences cause further differences in aggressiveness between individuals (Toates F 2011). This suggests that when assessing Dee's behaviour, we should look at more than just testosterone levels, but also perhaps her serotonin levels, particularly as she said she has always been a little short tempered, even before her steroid use began. Furthermore, genetic, and individual differences in human personality mean that Dee may respond differently. For example, she is evidently very motivated as she is described as passionate and becoming addicted to training, suggesting she strives for success. This could influence her behaviour since it may be a result of her feeling frustrated by the fact that she is so dedicated, but is yet to win any competitions.

5. **What might be the best advice to give Dee about her steroid use and this hobby?**

Dee is evidently experiencing some of the negative psychological effects associated with taking steroids, such as aggressive and manic behaviour, whilst also showing signs of addiction since she says she has become addicted to training and building muscle mass, so is taking steroids to aid this. This is unhealthy for her and consequentially it would be advisable for her to come off the steroids gradually as opposed to suddenly, because this can result in withdrawal symptoms (NHS). She will still be able to pursue her goals and hobby, however should look at healthier ways to increase her fitness and body mass which will not have negative physical and psychological effects, such as a bulking diet.

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Case Study 2- The Case of patient RA

RA is a 32-year-old male who was involved in a road traffic accident. The rear wheel of his bicycle was hit by a car, which caused him to hit a high curb and fall forward over the handlebars hitting his forehead on the pavement. RA was unconscious for a period of 30 minutes. When he regained consciousness he reported feeling dizzy, confused, and disorientated. He had no recollection of the accident or his whereabouts for an indeterminate amount of time before the accident. After an overnight stay in hospital, he reported feeling much better the following day and was discharged from hospital having been told that he had sustained a moderate brain injury and might experience symptoms for up to a year. RA insisted he was fine and would be returning to work and normal day-to-day activities the following day. A couple of weeks after being discharged, RAs family and co-workers started to notice differences in him. They claimed he was having trouble remembering personal events before and after the accident and that he was often irritable and fatigued. RA works as a journalist, his line manager commented that that the quality of RA's writing is as good as it had been before the accident. However, he added that RA was forgetting to attend meetings and seemed less organised and distractible than before. Although RA was adamant that he was fine, his friends and family convinced him to go for a neuropsychological evaluation.

Using the suggested references, your textbook(s), and online resources (i.e. other references you can find), address and discuss the following:

1. **What neuropsychological disorder is RAs symptoms most indicative of and how might RA's behavioural issues (e.g. irritability, fatigue) be related to the cognitive issues?**

RA is likely suffering from post-concussion syndrome, which affects memory, mood, and organisation for up to a year after injury (Martin, Carlson and Buskist 2013). This would explain RA's symptoms affecting his mood since he has described being irritable, fatigued, and distractible. His memory has also been impaired since he had no recollection of the accident, has trouble remembering personal events before and after the accident and has been forgetting to attend meetings, this also shows he has been less organised.

2. **Explain which tests might a neuropsychologist use to diagnose this disorder?**

Neuroimaging techniques such as a computerised tomography (CT) scan or magnetic resonance imaging (MRI) may be used to look for any structural brain abnormalities and diagnose post-concussion syndrome (Mayo Clinic). CT scans use x-ray images, whilst MRI's use large magnetic fields and radio waves to measure movements in hydrogen protons, allowing them to be used to 'see' different body tissues. 3D images are then made up of voxels depending on the radio waves emitted from the tissue (Martin, Carlson and Buskist 2004).

3. **Explain a conceptual/methodological issue that might affect the neuropsychological testing RA has undergone**

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CT scans have been replaced by MRI since the image from x-rays are less detailed and may be less reliable. However, MRI scans can also be inaccurate due to the fact that slight movement affects the quality of the image produced and MRI images sometimes over interpret, reducing the reliability of the method (Martin, Carlson and Buskist 2004).

4. **How might a neuropsychologist go about ensuring that RA's symptoms are not the product of Malingering?**

Malingering is pretending to be sick when you aren't or overexaggerating the symptoms, in particular if there is a reward to be gained as a result (DSM-IV). If this issue was to be suspected of RA the neuropsychologist should consider any reasons that RA may have for secondary gain. A psychological evaluation would be appropriate in order to identify malingering by using methods such as the clinical interview which provides objective data about whether or not he has answered honestly to the test, as opposed to exaggerating psychological problems and symptoms (Bass and Halligan).

5. **Under what conditions might the restoration of normal performance on everyday tasks for RA NOT be indicative of recovery?**

The damage that RA incurred from his injury was to his memory and mood as opposed to his ability to function and complete everyday tasks. Being able to complete such everyday tasks would not depend on the damaged parts of his brain, and ultimately not all everyday tasks would even draw on RA's cognitive ability beyond having a routine. As a result, his restoration of normal performance on everyday tasks cannot be indicative of recovery since you cannot generalise everyday tasks. Additionally, good performance in such tasks does not correlate with a good recovery, for example we are unable to gauge mood (something which was affected as a result of the accident) from RA's ability to cook.

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Word count –

Case study 1: 602 *Case study 2:* 432 *Total:* 1,034

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